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Detroit Edison



10CFR50.73

August 18, 1998
NRC-98-0108

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D C 20555

Reference: Fermi - 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Licensee Event Report (LER) No. 98-004

Pursuant to 10 CFR 50.73, Detroit Edison Company is submitting the enclosed LER No. 98-004 documenting an unplanned manual reactor scram in response to reactor power fluctuations.

The following commitment is being made in this LER:

The No. 4 High Pressure Turbine Control Valve (HPTCV) will remain closed and the Unit will be operated at reduced power until the sixth refueling outage.

If you have any questions, please contact Norman K. Peterson, Director Nuclear Licensing (734)-586-4258.

Sincerely,

cc: Regional Administrator, USNRC Region III
B. L. Burgess
G. A. Harris
A. J. Kugler
M. V. Yudas, Jr.
Region III
Wayne County Emergency Management Division

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1166 LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fermi - 2	DOCKET NUMBER (2) 0 5 0 0 0 3 4 1	PAGE (3) 1 OF 4
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TITLE (4) **Manual Scram in Response to Reactor Power Fluctuations**

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)												
MON	DAY	YR	YR	SEQUENTIAL NUMBER			REVISION NUMBER		MON	DAY	YR	FACILITY NAMES		DOCKET NUMBER (5)								
7	19	98	98	-	0	0	4	-	0	0	8	18	98			0	5	0	0	0		
																0	5	0	0	0		

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)	
POWER LEVEL (10) 0 6 2	<div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> 10 CFR 50.73(a)(2)(iv) <input type="checkbox"/> OTHER - _____ </div> <p style="text-align: center;">(Specify in Abstract below and in text, NRC Form 366A)</p>	

LICENSEE CONTACT FOR THIS LER (12) Ron Wittschen - Compliance Engineer		TELEPHONE NUMBER AREA CODE 734 NUMBER 586-1267	
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	
X	T	A	F	C	V	E	2	7	5	Yes

SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)				EXPECTED SUBMISSION DATE (15) <input checked="" type="checkbox"/> NO		MONTH	DAY	YEAR

ABSTRACT (16)

On July 19, 1998 at approximately 1000 hours, a reactor power reduction was commenced in preparation for a control rod pattern adjustment. Power was reduced to approximately 64% using the reactor recirculation pumps and the control rods. With the reactor at approximately 64% power, the operator noted that reactor power began fluctuating between 50% and 75%. Main Steam flow, flow to both Main Steam Reheaters, and reactor pressure, were also fluctuating.

The control room operator immediately placed the reactor mode switch in the Shutdown position. All control rods were fully inserted and no Safety Relief Valves lifted. The Emergency Operating Procedures (EOPs) were entered based on reactor water level decreasing to a level 3 condition, an expected condition following the scram. All safety equipment functioned properly in response to the scram. Plant conditions were such that no Emergency Core Cooling Systems were required to initiate. Reactor vessel water level was restored and the EOPs were then exited. Power level at the time of the scram was approximately 62%.

The most probable cause of the reactor power fluctuations was determined to be unstable flow through the No. 4 High Pressure Turbine Control Valve (HPTCV). Operation for the remainder of the cycle with the No. 4 HPTCV closed was evaluated and it was determined that the plant could be operated safely in this condition with the resultant reduction in power required to accommodate it.

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INITIAL PLANT CONDITIONS:

Operational Condition: 1 Power Operation
 Reactor Power: 62 Percent
 Reactor Pressure: 985 psig
 Reactor Temperature: 533 degrees Fahrenheit

DESCRIPTION OF THE EVENT:

On July 19, 1998 at approximately 1000 hours, a reactor power reduction was commenced in preparation for making the final scheduled control rod pattern adjustment for Cycle 6. Power was reduced to approximately 64% using the reactor recirculation pumps and the control rods. At 1210 hours, minor fluctuations in main steam reheater and feedwater heater flows were observed. These were accompanied by fluctuations of approximately 3% in reactor power concurrent with fluctuations in feed flow/steam flow. Changing turbine valve position summation indication was also noted. The plant fluctuations were stabilized by placing the heater drain pump flow controllers in manual. Once this was accomplished, flows and power stabilized.

The control rod pattern exchange began at 1645 hours. The first six rods were adjusted with no unusual conditions noted. Rod 46-23 was then selected to be withdrawn. A rod block was received at position 30 from the Rod Block Monitor, as expected, at 1727 hours. With the reactor at approximately 64% power, the operators noted that reactor power began fluctuating between 50% and 75%. Main Steam flow, flow to both Main Steam Reheaters (MSRs), and reactor pressure, were also fluctuating.

The control room operator immediately placed the reactor mode switch in the Shutdown position. All control rods fully inserted. The Emergency Operating Procedures (EOPs) were entered based on reactor water level decreasing to a level 3 condition, an expected condition following the scram. The operators took manual control of the reactor feed pump to feed the reactor and returned level to the normal operating band, in accordance with EOPs. Power level at the time of the scram was approximately 62%.

The event resulted in a manual reactor scram and automatic actuation of the Engineered Safety Features (ESF) Level 3 Primary Containment Isolations for Groups 4, 13, and 15. Safety equipment functioned as designed. This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv).

CAUSE OF THE EVENT:

Minor fluctuations in reactor power had previously been observed on May 31, 1998 during a control rod pattern adjustment. The May event was investigated but the exact cause was not determined. It was noted that the minor fluctuation occurred at reduced power, in the range 60% to 70% power. As a result, enhanced monitoring was implemented for use during subsequent power reductions. This enhanced monitoring was in place prior to the planned July 19, 1998 control rod adjustment.

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During the July 19, 1998 control rod pattern adjustment, the High Pressure Turbine Control Valve (HPTCV) [EIIIS:FCV] took a step change with no observed power increase on two occasions. Data taken by the enhanced monitoring program was reviewed and it was determined that the problem was with the valve. The most probable cause of the reactor power fluctuations was determined to be unstable steam flow through the No. 4 HPTCV. The cause of the unstable flow could not be determined without disassembly of the HPTCV. Looseness beyond that which would be expected from normal operation was noted in the valve stem linkage. The Sixth Refueling Outage (RF06) was scheduled to begin in approximately 6 weeks, therefore, it was decided not to disassemble the valves until the outage. Operation for the remainder of the cycle with the No. 4 HPTCV closed was evaluated and it was determined that the plant could be operated safely at reduced power with the valve closed.

At the time of the scram, no significant in-plant activities were in progress other than the control rod pattern adjustment.

During the subsequent plant startup with the No. 4 HPTCV closed, a minor power fluctuation was experienced. This was determined to be caused by the No. 3 HPTCV. The stem linkage on the No. 3 HPTCV was found to have some looseness, but less than that found on the No. 4 HPTCV.

ANALYSIS OF THE EVENT:

Control room operators took conservative and timely actions when confronted with the anomalous reactor conditions. A manual scram was inserted within 27 seconds following the onset of power fluctuations. Operators adequately utilized procedures for scram recovery actions and to reconfigure plant systems and equipment to support Operational Condition 3. All safety systems and components challenged by this event responded as designed. All reactor parameters were maintained well within design limits, during and following the scram.

Therefore, the health and safety of the public was not adversely affected.

CORRECTIVE ACTIONS

Data was reviewed for the period 1996 to present at times when the plant was operated between 60% and 70% power. Comparison of expected HPTCV position indicated that the anomalies started with the May 31, 1998 event.

No additional control rod pattern adjustments or power reductions are planned before the refueling outage. The evaluation of operation with one turbine control valve closed concluded that a reactor power level of 88% could be safely achieved. For the remainder of Cycle 6, the number 4 HPTCV will remain closed and the unit will be operated at reduced power.

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Enhanced monitoring of the HPTCVs will continue through the remainder of the Cycle. During RF06 the No. 4 HPTCV will be disassembled and inspected. The other three HPTCVs will be evaluated for corrective actions based on these results.

ADDITIONAL INFORMATION:

A. Failed Components:

The No. 4 High Pressure Turbine Control Valve is considered to have failed.

GECA (English Electric)

24 inch Globe

Mark No. N3021F004D

A. Previous LERs on Similar Problems:

No LERs which resulted from reactor power fluctuations were identified.

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

SUBJECT: Forwards LER 98-004-00 documenting unplanned manual reactor scram in response to reactor power fluctuations. Commitment made by util, listed.

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